

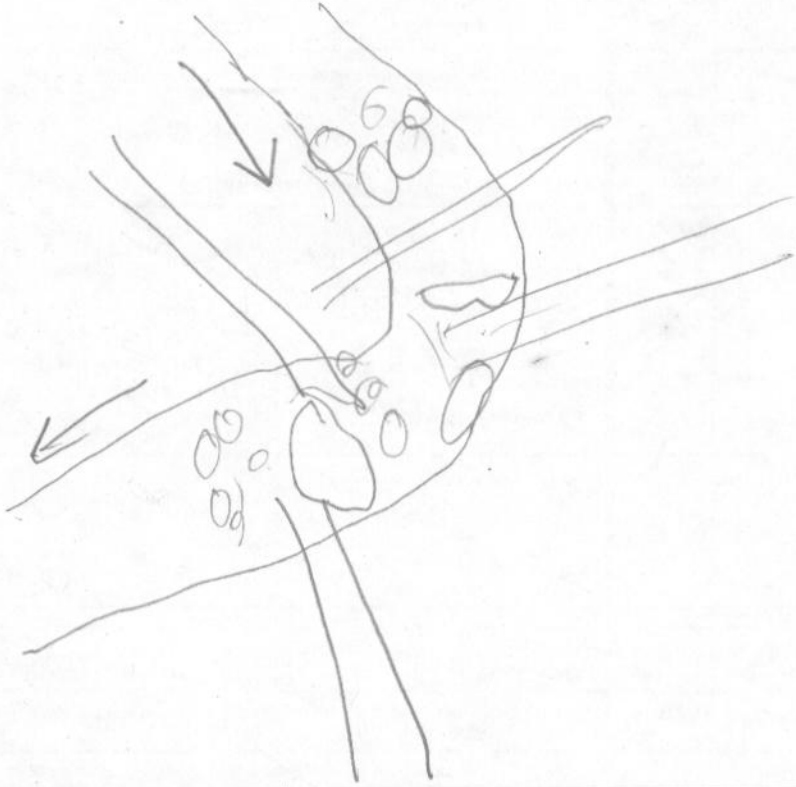
National Park Service
Inventory and Monitoring Program
Northeast Temperate Network
Lakes, Streams, and Ponds Monitoring
Rapid Hydro-geomorphic Assessment

CONTENTS:

2012 Original datasheets organized by year, then site.

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>POQUE STREAM</u>	LOCATION <u>MABISA</u>	
STATION # <u>1</u> RIVERMILE	STREAM CLASS	
LAT <u>43° 38.018'</u> LONG <u>72° 36.768'</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS <u>BES, WGG</u>		
FORM COMPLETED BY <u>WGG</u>	DATE <u>7/10/12</u> TIME <u>1003</u> AM PM	REASON FOR SURVEY <u>ANNUAL</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☒ %cloud cover ☒ clear/sunny	Past 24 hours ☐ ☐ ☐ ☒ % ☒	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>19.3</u> °C Other _____
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) 		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____ Stream Type ☒ Coldwater ☐ Warmwater Catchment Area _____ km ²		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources
			Local Watershed Erosion ☐ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous dominant species present <u>oaks, evergreen, maples: hard wood, conifer mix</u>		
YSI Do drop hi → 10 OK Do chg: 40.0 39.0 BP = 737.9 Do LOM gain 1.02995 DOCA/ 99.9	Estimated Reach Length <u>30</u> m Estimated Stream Width <u>2</u> m Sampling Reach Area <u>60</u> m ² Area in km ² (m ² x 0.001) _____ km ² Estimated Stream Depth <u>0.25</u> m ft Surface Velocity <u>0.32</u> m/sec <u>0.1</u> ft/s		Canopy Cover ☒ Partly open ☒ Partly shaded ☐ Shaded High Water Mark <u>6</u> m extreme 5m normal high Proportion of Reach Represented by Stream Morphology Types ☒ Riffle <u>50</u> % ☒ Run <u>10</u> % ☒ Pool <u>40</u> % Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No
	LWD <u>0</u> m ² Density of LWD <u>0</u> m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present <u>?</u> Portion of the reach with aquatic vegetation <u>10</u> %		
WATER QUALITY	Temperature <u>12.33</u> °C Specific Conductance <u>221</u> µS/cm Dissolved Oxygen <u>99.1%</u> (<u>10.67</u> mg/L) pH <u>8.00</u> Turbidity <u>N/A (color)</u> (<u>0.03</u> NTU) <u>7/2/12</u> WQ Instrument Used <u>YSI</u>		Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____
	SEDIMENT/SUBSTRATE Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse		Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand ☐ Relict shells ☒ Other <u>silt</u> Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<u>2</u>	Detritus	sticks, wood, coarse plant materials (CPOM)	<u>40</u>
Boulder	> 256 mm (10")	<u>20</u>			
Cobble	64-256 mm (2.5"-10")	<u>35</u>			
Gravel	2-64 mm (0.1"-2.5")	<u>5</u>	Muck-Mud	black, very fine organic (FPOM)	<u>0</u>
Sand	0.06-2mm (gritty)	<u>25</u>	Marl	grey, shell fragments	<u>0</u>
Silt	0.004-0.06 mm	<u>5-10</u>			
Clay	< 0.004 mm (slick)	<u>3</u>			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Pogue Brook</u>	LOCATION <u>Marsh Billings MABISA</u>	
STATION # <u>1</u> RIVERMILE	STREAM CLASS	
LAT <u>43.635124</u> LONG <u>-72.529396</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS <u>WGG, BEG</u>		
FORM COMPLETED BY	DATE <u>7/10/12</u> TIME <u>10:00</u> AM PM	REASON FOR SURVEY <u>Annual</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient). SCORE <u>10</u>	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common. SCORE <u>8</u>	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
3. Pool Variability Even mix of large-shallow, large-deep, small-shallow, small-deep pools present. SCORE <u>9</u>	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
4. Sediment Deposition Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. SCORE <u>10</u>	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. SCORE <u>13</u>	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0

From high-gradient

* 2a

high embeddedness

Score: 12

Score: 12

3a:

Score: 10

Parameters to be evaluated in sampling reach

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern. SCORE 18	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.) SCORE 14	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) SCORE 3 (LB) SCORE 6 (RB)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream. SCORE 1 (LB) SCORE 2 (RB)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone) SCORE 9 (LB) SCORE 9 (RB)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>Mill Brook</u>	LOCATION <u>MIMA</u>	
STATION # <u>MIMASA RIVERMILE</u>	STREAM CLASS	
LAT <u>42.462826</u> LONG <u>-71.351448</u>	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS <u>Bet</u>	DATE <u>7/30/12</u>	
FORM COMPLETED BY <u>Bet</u>	DATE TIME <u>7:27</u> AM ☒ PM	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) <u>10</u> % ☒ %cloud cover ☒ clear/sunny	Past 24 hours ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☐ %cloud cover ☒ clear/sunny	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>26.2</u>°C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____ Stream Type ☐ Coldwater ☒ Warmwater Catchment Area _____ km²		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☐ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other ☒ Residential	Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☒ Obvious sources Local Watershed Erosion ☐ None ☐ Moderate ☒ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☐ Trees ☐ Shrubs ☒ Grasses ☒ Herbaceous dominant species present <u>Japanese knotweed</u>	
INSTREAM FEATURES	Estimated Reach Length <u>20</u> m Estimated Stream Width <u>3</u> m Sampling Reach Area <u>60</u> m ² Area in km² (m² x 1000) <u>0.06</u> km ² Estimated Stream Depth <u>0.5</u> m ft Surface Velocity (at thalweg) <u>0.25</u> m/sec <u>0.4</u> ft/s Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark <u>1</u> m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle ☐ Run ☒ Pool <u>100</u> % ☐ Riffle ☐ Run ☐ Pool Channelized ☒ Yes ☐ No Dam Present ☐ Yes ☒ No	
LARGE WOODY DEBRIS	LWD <u>0</u> m ² Density of LWD <u>0</u> m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation <u>20</u> %	
WATER QUALITY	Temperature <u>21.1</u> °C Specific Conductance <u>723</u> Dissolved Oxygen <u>77.4</u> pH <u>7.14</u> Turbidity <u>4.95</u> WQ Instrument Used <u>YSI</u> Water Odors ☐ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☐ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____	
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☒ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☒ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☒ Other <u>mud</u> Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<u>0</u>	Detritus	sticks, wood, coarse plant materials (CPOM)	<u>10</u>
Boulder	> 256 mm (10")	<u>5</u>			
Cobble	64-256 mm (2.5"-10")	<u>3</u>	Muck-Mud	black, very fine organic (FPOM)	<u>70</u>
Gravel	2-64 mm (0.1"-2.5")	<u>2</u>			
Sand	0.06-2mm (gritty)	<u>10</u>	Marl	grey, shell fragments	<u>0</u>
Silt	0.004-0.06 mm	<u>80</u>			
Clay	< 0.004 mm (slick)	<u>0</u>			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

MIMASA

STREAM NAME <u>Mill Brook</u>	LOCATION <u>MJ Nuetman NHP (MIMA)</u>	
STATION # <u>MIMASA</u> RIVERMILE	STREAM CLASS	
LAT <u>42.462826</u> LONG <u>-71.351498</u>	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY <u>BEJ</u>	DATE <u>7/30/12</u> TIME <u>14:00</u> AM ☒ PM	REASON FOR SURVEY <u>Annual</u>

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
2a: 3	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 <u>2</u> 1 0
3a: 4	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 <u>11</u>	10 9 8 7 6	5 4 3 2 1 0
7a: 6	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 <u>3</u> 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 <u>9</u> 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 <u>14</u> 13 12 11	10 9 8 7 6	5 4 3 2 1 0

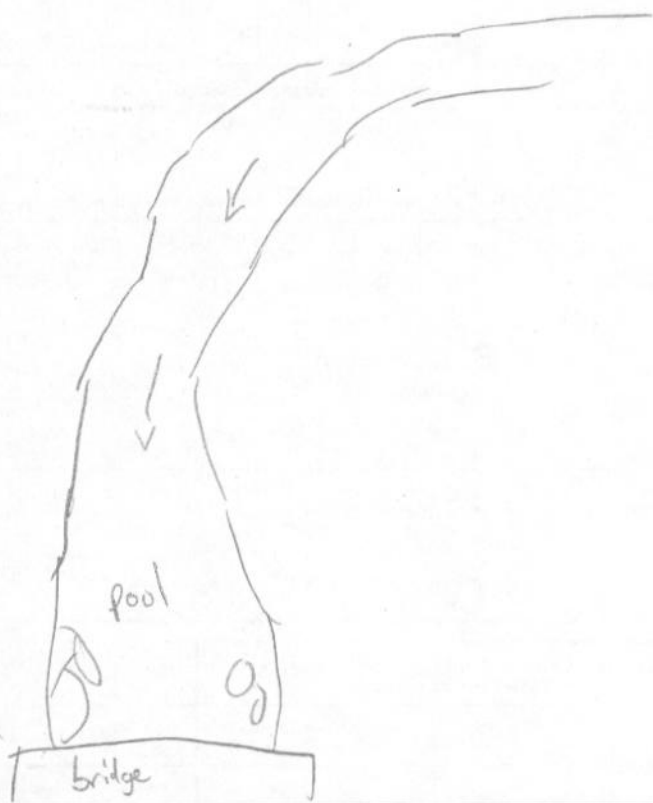
HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE <u>2</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>3</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE <u>6</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>5</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE <u>3</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>4</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

Total Score _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>Elm Brook</u>	LOCATION <u>MIMASB</u>	
STATION # <u>MIMASB</u> RIVERMILE	STREAM CLASS	
LAT <u>42.452824</u> LONG <u>-71.304189</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS		
FORM COMPLETED BY <u>RGA</u>	DATE <u>7/30/12</u> TIME <u>1415</u> AM ☒ PM	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ showers (intermittent) ☐ %cloud cover ☒ clear/sunny	Past 24 hours ☐ ☐ ☐ ☐ % ☒	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>25.2</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
			
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal		
	Stream Type ☒ Coldwater ☐ Warmwater Catchment Area _____ km ²		
	Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☒ Residential		Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☒ Obvious sources
			Local Watershed Erosion ☐ None ☒ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☒ Grasses ☐ Herbaceous dominant species present _____		
INSTREAM FEATURES	Estimated Reach Length 20 m Estimated Stream Width 1 m Sampling Reach Area 20 m ² Area in km² (m² x 1000) 0.02 km ² Estimated Stream Depth 1.8 m ft Surface Velocity (at thalweg) 0.2 m/sec CPHS		Canopy Cover ☐ Partly open ☐ Partly shaded ☒ Shaded High Water Mark 1 m Proportion of Reach Represented by Stream Morphology Types ☒ Riffle 30% ☒ Run 30% ☐ Pool 40%
			Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No
LARGE WOODY DEBRIS	LWD 1 m ² Density of LWD 0.5 m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation 30%		
WATER QUALITY	Temperature 19.3 °C Specific Conductance 578 Dissolved Oxygen 95.4 pH 7.27 Turbidity 2.41 WQ Instrument Used YSI		Water Odors ☐ Normal/None ☐ Sewage ☐ Petroleum ☒ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☐ Clear ☒ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____
SEDIMENT/SUBSTRATE	Odors ☐ Normal ☐ Sewage ☐ Petroleum ☒ Chemical ☒ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")	5			
Cobble	64-256 mm (2.5"-10")	40	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	30			
Sand	0.06-2mm (gritty)	15	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Elm Brook</u>	LOCATION <u>MIMASB</u>	
STATION # <u>RIVERMILE</u>	STREAM CLASS	
LAT <u>45.452824</u> LONG <u>-71.304184</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS		
FORM COMPLETED BY <u>RES</u>	DATE <u>7/20/12</u> TIME <u>14:15</u> AM ☒ PM	REASON FOR SURVEY <u>Annual</u>

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2a: 15	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3a: 13	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 7 (LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 (3)	2 1 0

Total Score _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>Primrose East</u>	LOCATION <u>Morristown MORRSA</u>	
STATION # <u>MORRSA</u> RIVERMILE	STREAM CLASS	
LAT <u>40.770042</u> LONG <u>-74.524254</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS <u>SCA, BES</u>		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/19/12</u> TIME <u>8:40</u> <u>AM</u> PM	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ showers (intermittent) ☐ %cloud cover <u>100%</u> ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>22.3</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal		
	Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km ²		
Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____			

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources Local Watershed Erosion ☐ None ☒ Moderate ☐ Heavy																												
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____																														
INSTREAM FEATURES	<table border="0"> <tr> <td>Estimated Reach Length</td> <td>20 m</td> <td>Canopy Cover</td> <td>☐ Partly open ☒ Partly shaded ☐ Shaded</td> </tr> <tr> <td>Estimated Stream Width</td> <td>1.5 m</td> <td>High Water Mark</td> <td>1 m</td> </tr> <tr> <td>Sampling Reach Area</td> <td>30 m²</td> <td>Proportion of Reach Represented by Stream Morphology Types</td> <td></td> </tr> <tr> <td>Area in km² (m² x 1000)</td> <td>_____ km²</td> <td>☐ Riffle 30% ☐ Run 50%</td> <td></td> </tr> <tr> <td>Estimated Stream Depth</td> <td>2 m ft</td> <td>☐ Pool 20%</td> <td></td> </tr> <tr> <td>Surface Velocity (at thalweg)</td> <td>.3 m/sec ft/s</td> <td>Channelized</td> <td>☐ Yes ☐ No</td> </tr> <tr> <td></td> <td></td> <td>Dam Present</td> <td>☐ Yes ☐ No</td> </tr> </table>			Estimated Reach Length	20 m	Canopy Cover	☐ Partly open ☒ Partly shaded ☐ Shaded	Estimated Stream Width	1.5 m	High Water Mark	1 m	Sampling Reach Area	30 m ²	Proportion of Reach Represented by Stream Morphology Types		Area in km ² (m ² x 1000)	_____ km ²	☐ Riffle 30% ☐ Run 50%		Estimated Stream Depth	2 m ft	☐ Pool 20%		Surface Velocity (at thalweg)	.3 m/sec ft/s	Channelized	☐ Yes ☐ No			Dam Present	☐ Yes ☐ No
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LARGE WOODY DEBRIS	LWD 0 m ² Density of LWD 0 m ² /km ² (LWD/ reach area)																														
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation 5%																														
WATER QUALITY	<table border="0"> <tr> <td>Temperature</td> <td>18.6 °C</td> <td>Water Odors</td> <td>☒ Normal/None ☐ Sewage</td> </tr> <tr> <td>Specific Conductance</td> <td>133</td> <td>☐ Petroleum ☐ Chemical</td> <td></td> </tr> <tr> <td>Dissolved Oxygen</td> <td>93.0</td> <td>☐ Fishy ☐ Other _____</td> <td></td> </tr> <tr> <td>pH</td> <td>7.23</td> <td>Water Surface Oils</td> <td>☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks</td> </tr> <tr> <td>Turbidity</td> <td>1.28</td> <td>☒ None ☐ Other _____</td> <td></td> </tr> <tr> <td>WQ Instrument Used</td> <td>YSI</td> <td>Turbidity (if not measured)</td> <td>☒ Clear ☐ Slightly turbid ☐ Turbid</td> </tr> <tr> <td></td> <td></td> <td>☐ Opaque ☐ Stained</td> <td>☐ Other _____</td> </tr> </table>			Temperature	18.6 °C	Water Odors	☒ Normal/None ☐ Sewage	Specific Conductance	133	☐ Petroleum ☐ Chemical		Dissolved Oxygen	93.0	☐ Fishy ☐ Other _____		pH	7.23	Water Surface Oils	☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks	Turbidity	1.28	☒ None ☐ Other _____		WQ Instrument Used	YSI	Turbidity (if not measured)	☒ Clear ☐ Slightly turbid ☐ Turbid			☐ Opaque ☐ Stained	☐ Other _____
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SEDIMENT/SUBSTRATE	<table border="0"> <tr> <td>Odors</td> <td>☐ Sewage ☐ Petroleum</td> <td>Deposits</td> <td>☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand</td> </tr> <tr> <td>☒ Normal ☐ Chemical ☐ Other _____</td> <td>☐ Anaerobic ☐ None</td> <td>☐ Relict shells ☐ Other _____</td> <td></td> </tr> <tr> <td>Oils</td> <td>☒ Absent ☐ Slight ☐ Moderate ☐ Profuse</td> <td colspan="2">Looking at stones which are not deeply embedded, are the undersides black in color?</td> </tr> <tr> <td></td> <td></td> <td colspan="2">☐ Yes ☒ No</td> </tr> </table>			Odors	☐ Sewage ☐ Petroleum	Deposits	☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand	☒ Normal ☐ Chemical ☐ Other _____	☐ Anaerobic ☐ None	☐ Relict shells ☐ Other _____		Oils	☒ Absent ☐ Slight ☐ Moderate ☐ Profuse	Looking at stones which are not deeply embedded, are the undersides black in color?				☐ Yes ☒ No													
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Oils	☒ Absent ☐ Slight ☐ Moderate ☐ Profuse	Looking at stones which are not deeply embedded, are the undersides black in color?																													
		☐ Yes ☒ No																													

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	30
Boulder	> 256 mm (10")	10	Muck-Mud	black, very fine organic (FPOM)	0
Cobble	64-256 mm (2.5"-10")	50	Marl	grey, shell fragments	0
Gravel	2-64 mm (0.1"-2.5")	10			
Sand	0.06-2mm (gritty)	20			
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Primrose East</u>	LOCATION <u>Morrison</u>	<u>MORRSA</u>
STATION # <u>MORRSA</u> RIVERMILE	STREAM CLASS	
LAT <u>40.770042</u> LONG <u>-74.524284</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS <u>SCA, BES</u>		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/19/12</u> TIME <u>8:40</u> AM PM	REASON FOR SURVEY <u>Annex</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 <u>12</u> 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 <u>7</u> 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 <u>4</u> 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 <u>4</u> 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 <u>7</u> 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE ____ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ____ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE ____ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ____ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE ____ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ____ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

Total Score 112

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>Primrose Confluent</u>	LOCATION <u>Morristown NHP MORRISB</u>	
STATION # <u>MORRISB</u> RIVERMILE	STREAM CLASS	
LAT <u>40.764446</u> LONG <u>-74.529358</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS <u>BEA, SGA</u>		
FORM COMPLETED BY <u>BSJ</u>	DATE <u>7/19/12</u> TIME <u>11:45</u> AM PM	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☒ 100% cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>22.5</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____ Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km ²		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____		
INSTREAM FEATURES	Estimated Reach Length <u>20</u> m Estimated Stream Width <u>2</u> m Sampling Reach Area <u>40</u> m ² Area in km² (m² x 0.001) _____ km ² Estimated Stream Depth <u>6 m ft</u> Surface Velocity (at thalweg) <u>.45 m/sec</u> <u>ft/s</u>		Canopy Cover ☐ Partly open ☐ Partly shaded ☒ Shaded High Water Mark _____ m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle <u>90</u> % ☐ Run <u>30</u> % ☐ Pool <u>30</u> % Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No
LARGE WOODY DEBRIS	LWD <u>0</u> m ² Density of LWD <u>0</u> m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation <u>10</u> %		
WATER QUALITY	Temperature <u>18.1</u> °C Specific Conductance <u>128</u> Dissolved Oxygen <u>93.3</u> pH <u>7.41</u> Turbidity <u>1.41</u> WQ Instrument Used <u>YSI</u>		Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____
SEDIMENT/ SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	<u>0</u>
Boulder	> 256 mm (10")	<u>5</u>	Muck-Mud	black, very fine organic (FPOM)	<u>0</u>
Cobble	64-256 mm (2.5"-10")	<u>40</u>	Marl	grey, shell fragments	<u>0</u>
Gravel	2-64 mm (0.1"-2.5")	<u>30</u>			
Sand	0.06-2mm (gritty)	<u>20</u>			
Silt	0.004-0.06 mm	<u>5</u>			
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <i>Primrose Confluence</i>	LOCATION <i>Morristown</i>	<i>MORRISB</i>
STATION # <i>MORRISB</i> RIVERMILE	STREAM CLASS	
LAT <i>40.764496</i> LONG <i>-74.52938</i>	RIVER BASIN	
STORET #	AGENCY <i>NPS</i>	
INVESTIGATORS <i>BEH, SCA</i>		
FORM COMPLETED BY <i>BEH</i>	DATE <i>7/19</i> TIME <i>11:45</i> AM PM	REASON FOR SURVEY <i>Annual</i>

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
2a: 13 3a: 9 7a: 17	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 <u>19</u> 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 <u>13</u> 12 11	<u>10</u> 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 <u>4</u> 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 <u>11</u>	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 <u>8</u> 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE ____ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ____ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE ____ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ____ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE ____ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ____ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

Total Score 151

2012 MORRSC 1 of 4

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

MORRSC

STREAM NAME <u>Primrose West</u>	LOCATION <u>Morristown</u>	
STATION # <u>MORRSC</u> RIVERMILE	STREAM CLASS	
LAT <u>40.769695</u> LONG <u>-74.535896</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS <u>SCA</u>		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/19/12</u> TIME <u>10:15</u> AM PM	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☒ 30% cloud cover ☐ clear/sunny Past 24 hours ☐ ☐ ☐ ☐ ☐ Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>22.1</u> °C Other _____
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km² Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources Local Watershed Erosion ☐ None ☒ Moderate ☐ Heavy																												
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____																														
INSTREAM FEATURES	<table border="0"> <tr> <td>Estimated Reach Length</td> <td>20 m</td> <td>Canopy Cover</td> <td>☒ Partly open ☐ Partly shaded ☐ Shaded</td> </tr> <tr> <td>Estimated Stream Width</td> <td>1.5 m</td> <td>High Water Mark</td> <td>1 m</td> </tr> <tr> <td>Sampling Reach Area</td> <td>300 m²</td> <td>Proportion of Reach Represented by Stream Morphology Types</td> <td></td> </tr> <tr> <td>Area in km² (m² x 0.001)</td> <td>_____ km²</td> <td>☐ Riffle</td> <td>20% ☐ Run 60% ☐ Pool 20%</td> </tr> <tr> <td>Estimated Stream Depth</td> <td>25 m FL</td> <td>Channelized</td> <td>☐ Yes ☒ No</td> </tr> <tr> <td>Surface Velocity (at thalweg)</td> <td>1 m/sec FL/S</td> <td>Dam Present</td> <td>☐ Yes ☒ No</td> </tr> </table>			Estimated Reach Length	20 m	Canopy Cover	☒ Partly open ☐ Partly shaded ☐ Shaded	Estimated Stream Width	1.5 m	High Water Mark	1 m	Sampling Reach Area	300 m ²	Proportion of Reach Represented by Stream Morphology Types		Area in km ² (m ² x 0.001)	_____ km ²	☐ Riffle	20% ☐ Run 60% ☐ Pool 20%	Estimated Stream Depth	25 m FL	Channelized	☐ Yes ☒ No	Surface Velocity (at thalweg)	1 m/sec FL/S	Dam Present	☐ Yes ☒ No				
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LARGE WOODY DEBRIS	LWD 0 m ² Density of LWD 0 m ² /km ² (LWD/ reach area)																														
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation 10%																														
WATER QUALITY	<table border="0"> <tr> <td>Temperature</td> <td>17.9 °C</td> <td>Water Odors</td> <td>☒ Normal/None ☐ Sewage</td> </tr> <tr> <td>Specific Conductance</td> <td>106</td> <td>☐ Petroleum ☐ Chemical</td> <td></td> </tr> <tr> <td>Dissolved Oxygen</td> <td>93.7</td> <td>☐ Fishy ☐ Other _____</td> <td></td> </tr> <tr> <td>pH</td> <td>7.15</td> <td>Water Surface Oils</td> <td>☐ Sluck ☐ Sheen ☐ Globs ☐ Flecks</td> </tr> <tr> <td>Turbidity</td> <td>0.75 NTU</td> <td>☒ None ☐ Other _____</td> <td></td> </tr> <tr> <td>WQ Instrument Used</td> <td>_____</td> <td>Turbidity (if not measured)</td> <td>☐ Clear ☐ Slightly turbid ☐ Turbid</td> </tr> <tr> <td></td> <td></td> <td>☐ Opaque ☐ Stained ☐ Other _____</td> <td></td> </tr> </table>			Temperature	17.9 °C	Water Odors	☒ Normal/None ☐ Sewage	Specific Conductance	106	☐ Petroleum ☐ Chemical		Dissolved Oxygen	93.7	☐ Fishy ☐ Other _____		pH	7.15	Water Surface Oils	☐ Sluck ☐ Sheen ☐ Globs ☐ Flecks	Turbidity	0.75 NTU	☒ None ☐ Other _____		WQ Instrument Used	_____	Turbidity (if not measured)	☐ Clear ☐ Slightly turbid ☐ Turbid			☐ Opaque ☐ Stained ☐ Other _____	
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SEDIMENT/SUBSTRATE	<table border="0"> <tr> <td>Odors</td> <td>☒ Normal ☐ Sewage ☐ Petroleum</td> <td>Deposits</td> <td>☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand</td> </tr> <tr> <td>☐ Chemical ☐ Anaerobic ☐ None</td> <td></td> <td>☐ Relict shells ☐ Other _____</td> <td></td> </tr> <tr> <td>Oils</td> <td>☒ Absent ☐ Slight ☐ Moderate ☐ Profuse</td> <td colspan="2">Looking at stones which are not deeply embedded, are the undersides black in color?</td> </tr> <tr> <td></td> <td></td> <td colspan="2">☐ Yes ☒ No</td> </tr> </table>			Odors	☒ Normal ☐ Sewage ☐ Petroleum	Deposits	☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand	☐ Chemical ☐ Anaerobic ☐ None		☐ Relict shells ☐ Other _____		Oils	☒ Absent ☐ Slight ☐ Moderate ☐ Profuse	Looking at stones which are not deeply embedded, are the undersides black in color?				☐ Yes ☒ No													
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		☐ Yes ☒ No																													

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	20
Boulder	> 256 mm (10")	5	Muck-Mud	black, very fine organic (FPOM)	0
Cobble	64-256 mm (2.5"-10")	15			
Gravel	2-64 mm (0.1"-2.5")	30	Marl	grey, shell fragments	0
Sand	0.06-2mm (gritty)	40			
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)	0			

2012 MORRSC 3 OF 4

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Primrose West</u>	LOCATION <u>Morristown</u>	
STATION # <u>MORRSC</u> RIVERMILE	STREAM CLASS	
LAT <u>40.769695</u> LONG <u>-74.535896</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS <u>BES, SCS</u>		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/19/12</u> TIME <u>10:15</u> AM PM	REASON FOR SURVEY <u>Annual</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 <u>16</u>	<u>15</u> 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	<u>10</u> 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 <u>9</u> 8 7 6	5 4 <u>3</u> 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 <u>13</u> 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 <u>6</u>	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE ____ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ____ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE ____ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ____ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE ____ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ____ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

Total Score 134

2012 MORRSD 10F4

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>Indian Grove</u>	LOCATION <u>Morristown MORRSD</u>	
STATION # <u>MORRSD</u> RIVERMILE _____	STREAM CLASS _____	
LAT <u>40.744606</u> LONG <u>-74.56321</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS <u>SOAS, BES</u>		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/19/12</u> AM ☒ PM ☐	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☒ 100% cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ NO Air Temperature <u>20.7</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal		Stream Type ☐ Coldwater ☐ Warmwater
	Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____		Catchment Area _____ km ²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☒ Residential		Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☒ Obvious sources Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____		
INSTREAM FEATURES	Estimated Reach Length 20 m Estimated Stream Width 4 m Sampling Reach Area 80 m ² Area in km² (m² x 1000) _____ km ² Estimated Stream Depth 1.2 m ft Surface Velocity (at thalweg) .45 m/sec ft/s Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark 1 m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle 20% ☐ Run 70% ☐ Pool 10% Channelized ☒ Yes ☐ No Dam Present ☐ Yes ☒ No		
LARGE WOODY DEBRIS	LWD 0 m ² Density of LWD 0 m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation 5%		
WATER QUALITY	Temperature 21.7 °C Specific Conductance 272 Dissolved Oxygen 94.0 pH 7.45 Turbidity .73 WQ Instrument Used YSI Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____		
SEDIMENT/SUBSTRATE	Odors ☐ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☒ Anaerobic ☐ None ☐ Other _____ Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	10
Boulder	> 256 mm (10")	20	Muck-Mud	black, very fine organic (FPOM)	0
Cobble	64-256 mm (2.5"-10")	40	Marl	grey, shell fragments	0
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	10			
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Indian Grove</u>	LOCATION <u>MORRISD Morristown</u>	
STATION # <u>RIVERMILE</u>	STREAM CLASS	
LAT <u>40.744606</u> LONG <u>-74.565521</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS <u>SCA, BES</u>		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/19/12</u> TIME <u>3:30</u> AM ☒ PM ☐	REASON FOR SURVEY <u>Annual</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11 <u>11</u>	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	<u>10</u> 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 <u>14</u> 13 12 11	10 9 8 7 6	<u>5</u> 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 <u>14</u> 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 <u>9</u> 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

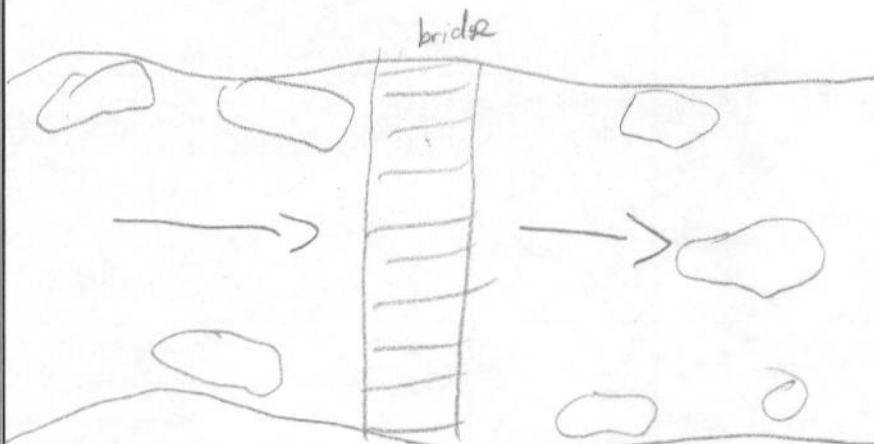
Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 <u>8</u> 7 6	<u>5</u> 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 <u>8</u> 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ____ (LB)	Left Bank 10 <u>9</u>	8 7 6	5 4 3	2 1 0
SCORE ____ (RB)	Right Bank 10 9	8 7 6	5 <u>4</u> 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ____ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 <u>1</u> 0
SCORE ____ (RB)	Right Bank 10 9	8 7 6	5 4 3	<u>2</u> 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE ____ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 <u>1</u> 0
SCORE ____ (RB)	Right Bank 10 9	8 7 6	5 4 <u>3</u>	2 1 0

Total Score 121

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

MORRSE

STREAM NAME <u>Passaic River</u>	LOCATION <u>MORRISTOWN</u>	
STATION # <u>MORRSE RIVERMILE</u>	STREAM CLASS	
LAT <u>40.75177</u> LONG <u>-74.551163</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS		
FORM COMPLETED BY <u>BEA</u>	DATE <u>7/19/12</u> TIME <u>19:00</u> AM ☒ PM	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ showers (intermittent) ☐ %cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>20.9</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
			
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal		
	Stream Type ☒ Coldwater ☒ Warmwater Catchment Area _____ km ²		
Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____			

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources
	Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy		
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous dominant species present ?		
INSTREAM FEATURES	Estimated Reach Length 20 m Estimated Stream Width 7 m Sampling Reach Area 140 m ² Area in km ² (m ² x 0.001) km ² Estimated Stream Depth 1.8 m ft Surface Velocity 0.3 m/sec (at thalweg) ft/s		Canopy Cover ☒ Partly open ☐ Partly shaded ☐ Shaded High Water Mark 2 m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle 40% ☐ Run 40% ☐ Pool 20% Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No
LARGE WOODY DEBRIS	LWD 0 m ² Density of LWD 0 m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present ? Portion of the reach with aquatic vegetation 5%		
WATER QUALITY	Temperature 21.8 °C Specific Conductance 266 Dissolved Oxygen 99.1 pH 7.48 Turbidity 5.79 NTU WQ Instrument Used YSI		Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other Water Surface Oils ☒ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other Turbidity (if not measured) ☐ Clear ☒ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other Oily ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand ☐ Relict shells ☐ Other Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	0
Boulder	> 256 mm (10")	30			
Cobble	64-256 mm (2.5"-10")	20	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	30	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	0			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Passaic River</u>	LOCATION <u>Morristown NHP MORRSE</u>	
STATION # <u>MORRSE RIVERMILE</u>	STREAM CLASS	
LAT <u>40.751663</u> LONG <u>-74.55163</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/19/12</u> TIME <u>14:00</u> AM ☒ PM	REASON FOR SURVEY <u>Annual</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 <u>13</u> 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 <u>7</u> 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 <u>2</u> 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 <u>11</u>	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 <u>7</u> 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE ___ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ___ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE ___ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ___ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE ___ (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE ___ (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

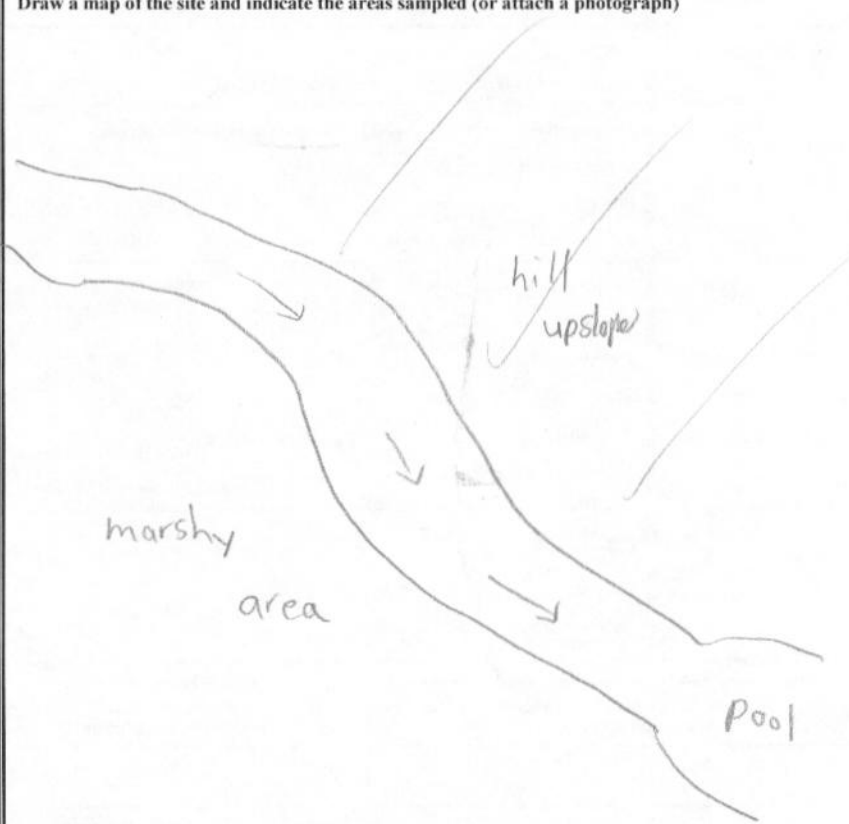
Total Score _____

2012 ROVASA 1 OF 4

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

ROVASA

STREAM NAME <u>Lower FDR Brook</u>	LOCATION <u>ROVA</u>
STATION # <u>RIVERMILE 739385</u>	STREAM CLASS
LAT <u>41.764214</u> LONG	RIVER BASIN
STORET #	AGENCY <u>NPS</u>
INVESTIGATORS <u>Tech, B&E</u>	
FORM COMPLETED BY <u>B&E</u>	DATE <u>7/26/12</u> TIME <u>12:00</u> AM ☒ PM ☐ REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☒ 100% cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>22.6</u> °C Other _____
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) 		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____ Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km ²		

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(BACK)**

WATERSHED FEATURES	Predominant Surrounding Landuse ☐ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential	Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____	
INSTREAM FEATURES	Estimated Reach Length <u>20</u> m Estimated Stream Width <u>1.5</u> m Sampling Reach Area <u>30</u> m ² Area in km² (m²x1000) _____ km ² Estimated Stream Depth <u>.3</u> m <u>ft</u> Surface Velocity (at thalweg) <u>.4</u> m/sec <u>cfs</u> Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark <u>1.5</u> m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle <u>20</u> % ☐ Run <u>70</u> % ☐ Pool <u>10</u> % Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No	
LARGE WOODY DEBRIS	LWD <u>2</u> m ² Density of LWD _____ m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☒ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation <u>20</u> %	
WATER QUALITY	Temperature <u>20.2</u> °C Specific Conductance <u>546</u> Dissolved Oxygen <u>92.3</u> pH <u>8.04</u> Turbidity <u>.66</u> WQ Instrument Used <u>YSI</u> Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____	
SEDIMENT/ SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	10
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	20	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	50			
Sand	0.06-2mm (gritty)	20	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Lower FDR Brook</u>	LOCATION <u>ROVASA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>41.764214</u> LONG <u>-73.939850</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS <u>Tech, BEE</u>	REASON FOR SURVEY _____	
FORM COMPLETED BY <u>BEE</u>	DATE <u>7/26/12</u> TIME <u>12:00</u> AM ☒ PM ☐	<u>Annual</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	<u>15</u> 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 <u>9</u> 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 <u>13</u> 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 <u>14</u> 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	<u>15</u> 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE 9 (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE 8 (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE 9 (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE 9 (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE 10 (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE 6 (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

Total Score _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

ROVASB

STREAM NAME <u>Upper PDR Brook</u>	LOCATION <u>ROVA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>41.740210</u> LONG <u>-73.938278</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS <u>Tech, B&S</u>	REASON FOR SURVEY _____	
FORM COMPLETED BY <u>B&S</u>	DATE TIME <u>7/24/12</u> <u>14:45</u> AM ☒ PM ☐	<u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ 30% showers (intermittent) ☐ %cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>26.8°C</u> Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____		
		Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km ²	

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy																												
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____																														
INSTREAM FEATURES	<table border="0"> <tr> <td>Estimated Reach Length</td> <td>20 m</td> <td>Canopy Cover</td> <td>☐ Partly open ☐ Partly shaded ☒ Shaded</td> </tr> <tr> <td>Estimated Stream Width</td> <td>1.5 m</td> <td>High Water Mark</td> <td>1 m</td> </tr> <tr> <td>Sampling Reach Area</td> <td>30 m²</td> <td>Proportion of Reach Represented by Stream Morphology Types</td> <td></td> </tr> <tr> <td>Area in km² (m² x 1000)</td> <td>_____ km²</td> <td>☐ Riffle 80 %</td> <td>☐ Run 40 %</td> </tr> <tr> <td>Estimated Stream Depth</td> <td>.4 m fl</td> <td>☐ Pool 20 %</td> <td></td> </tr> <tr> <td>Surface Velocity (at thalweg)</td> <td>.2 m/sec cfs</td> <td>Channelized</td> <td>☐ Yes ☒ No</td> </tr> <tr> <td></td> <td></td> <td>Dam Present</td> <td>☐ Yes ☒ No</td> </tr> </table>			Estimated Reach Length	20 m	Canopy Cover	☐ Partly open ☐ Partly shaded ☒ Shaded	Estimated Stream Width	1.5 m	High Water Mark	1 m	Sampling Reach Area	30 m ²	Proportion of Reach Represented by Stream Morphology Types		Area in km ² (m ² x 1000)	_____ km ²	☐ Riffle 80 %	☐ Run 40 %	Estimated Stream Depth	.4 m fl	☐ Pool 20 %		Surface Velocity (at thalweg)	.2 m/sec cfs	Channelized	☐ Yes ☒ No			Dam Present	☐ Yes ☒ No
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		Dam Present	☐ Yes ☒ No																												
LARGE WOODY DEBRIS	LWD 0 m ² Density of LWD 0 m ² /km ² (LWD/ reach area)																														
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation 5 %																														
WATER QUALITY	<table border="0"> <tr> <td>Temperature</td> <td>21.8 °C</td> <td>Water Odors</td> <td>☒ Normal/None ☐ Sewage</td> </tr> <tr> <td>Specific Conductance</td> <td>564</td> <td>☐ Petroleum ☐ Chemical</td> <td></td> </tr> <tr> <td>Dissolved Oxygen</td> <td>91.9</td> <td>☐ Fishy ☐ Other _____</td> <td></td> </tr> <tr> <td>pH</td> <td>7.95</td> <td>Water Surface Oils</td> <td>☐ Slick ☐ Sheen ☐ Globs ☐ Flecks</td> </tr> <tr> <td>Turbidity</td> <td>.56</td> <td>☒ None ☐ Other _____</td> <td></td> </tr> <tr> <td>WQ Instrument Used</td> <td>YSI</td> <td>Turbidity (if not measured)</td> <td>☒ Clear ☐ Slightly turbid ☐ Turbid</td> </tr> <tr> <td></td> <td></td> <td>☐ Opaque ☐ Stained</td> <td>☐ Other _____</td> </tr> </table>			Temperature	21.8 °C	Water Odors	☒ Normal/None ☐ Sewage	Specific Conductance	564	☐ Petroleum ☐ Chemical		Dissolved Oxygen	91.9	☐ Fishy ☐ Other _____		pH	7.95	Water Surface Oils	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks	Turbidity	.56	☒ None ☐ Other _____		WQ Instrument Used	YSI	Turbidity (if not measured)	☒ Clear ☐ Slightly turbid ☐ Turbid			☐ Opaque ☐ Stained	☐ Other _____
Temperature	21.8 °C	Water Odors	☒ Normal/None ☐ Sewage																												
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		☐ Opaque ☐ Stained	☐ Other _____																												
SEDIMENT/SUBSTRATE	<table border="0"> <tr> <td>Odors</td> <td>☒ Normal ☐ Sewage ☐ Petroleum</td> <td>Deposits</td> <td>☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand</td> </tr> <tr> <td>☐ Chemical ☐ Anaerobic ☒ None</td> <td></td> <td>☐ Relict shells ☐ Other _____</td> <td></td> </tr> <tr> <td>Oils</td> <td>☒ Absent ☐ Slight ☐ Moderate ☐ Profuse</td> <td colspan="2">Looking at stones which are not deeply embedded, are the undersides black in color?</td> </tr> <tr> <td></td> <td></td> <td colspan="2">☐ Yes ☒ No</td> </tr> </table>			Odors	☒ Normal ☐ Sewage ☐ Petroleum	Deposits	☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand	☐ Chemical ☐ Anaerobic ☒ None		☐ Relict shells ☐ Other _____		Oils	☒ Absent ☐ Slight ☐ Moderate ☐ Profuse	Looking at stones which are not deeply embedded, are the undersides black in color?				☐ Yes ☒ No													
Odors	☒ Normal ☐ Sewage ☐ Petroleum	Deposits	☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand																												
☐ Chemical ☐ Anaerobic ☒ None		☐ Relict shells ☐ Other _____																													
Oils	☒ Absent ☐ Slight ☐ Moderate ☐ Profuse	Looking at stones which are not deeply embedded, are the undersides black in color?																													
		☐ Yes ☒ No																													

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		30	Detritus	sticks, wood, coarse plant materials (CPOM)	0
Boulder	> 256 mm (10")	10			
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	10			
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	0			
Clay	< 0.004 mm (slick)	10			

2012 ROVA-SB 3 of 4

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Upper FOR Brook</u>	LOCATION <u>ROVA</u>	
STATION # <u> </u> RIVERMILE	STREAM CLASS	
LAT <u>41.770210</u> LONG <u>-73.938278</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS <u>Tech, BSA</u>		
FORM COMPLETED BY <u>BSA</u>	DATE <u>7/24/12</u> TIME <u>14:45</u> AM (PM)	REASON FOR SURVEY <u>Annual</u>

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
2a: 18 3a: 8 7a: 15	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern.		Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)		The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.		Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 6 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream. More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.		70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 5 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone) Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.		Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE 9 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

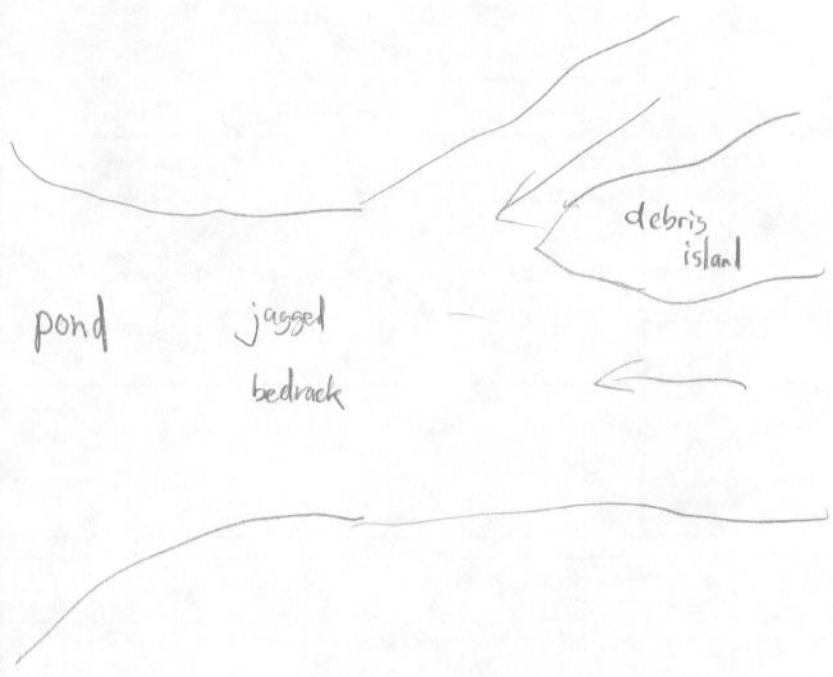
Total Score _____

2012 ROVASC 1 OF 4

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

ROVASC

STREAM NAME <u>Upper Crum Elbow Cr.</u>	LOCATION <u>ROVA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>41.795525</u> LONG <u>-73.939102</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS <u>Tech, B&A</u>		
FORM COMPLETED BY <u>B&A</u>	DATE TIME <u>9:45</u> <u>7/26/12</u> AM PM	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☒ 100% cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ NO Air Temperature <u>21.7</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
			
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____		
	Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km²		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☒ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other ☒ Residential		Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☒ Obvious sources Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____		
INSTREAM FEATURES	Estimated Reach Length <u>20</u> m Estimated Stream Width <u>10</u> m Sampling Reach Area <u>200</u> m ² Area in km ² (m ² x 1000) _____ km ² Estimated Stream Depth <u>1.7</u> m-ft Surface Velocity <u>.2</u> m/sec (at thalweg) <u>cfs</u> Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark <u>3</u> m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle <u>30</u> % ☐ Run <u>30</u> % ☐ Pool <u>40</u> % Channelized ☒ Yes ☐ No Dam Present ☒ Yes ☐ No		
LARGE WOODY DEBRIS	LWD <u>0</u> m ² Density of LWD <u>0</u> m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☐ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation <u>5</u> %		
WATER QUALITY	Temperature <u>21.7</u> °C Specific Conductance <u>377</u> Dissolved Oxygen <u>96.1</u> pH <u>8.08</u> Turbidity <u>0.54</u> WQ Instrument Used <u>YSI</u> Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other		
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<u>30</u>	Detritus	sticks, wood, coarse plant materials (CPOM)	<u>0</u>
Boulder	> 256 mm (10")	<u>20</u>			
Cobble	64-256 mm (2.5"-10")	<u>30</u>	Muck-Mud	black, very fine organic (FPOM)	<u>0</u>
Gravel	2-64 mm (0.1"-2.5")	<u>20</u>			
Sand	0.06-2mm (gritty)	<u>0</u>	Marl	grey, shell fragments	<u>0</u>
Silt	0.004-0.06 mm	<u>0</u>			
Clay	< 0.004 mm (slick)	<u>0</u>			

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HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Upper Cran Elbow Ck</u>	LOCATION <u>ROVA</u>	
STATION # <u> </u> RIVERMILE <u> </u>	STREAM CLASS <u> </u>	
LAT <u>41.78923</u> LONG <u>-73.939102</u>	RIVER BASIN <u> </u>	
STORET # <u>41.795525</u>	AGENCY <u>NPS</u>	
INVESTIGATORS <u>Tech, BES</u>		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/26/12</u> TIME <u>9:45</u> AM PM	REASON FOR SURVEY <u>Annual</u>

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
2a: 17 3a: 14 7a: 17	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE <u>8</u> (LB)	Left Bank					<u>8</u>					5					2					
SCORE <u>8</u> (RB)	Right Bank					<u>8</u>					5					2					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE <u>7</u> (LB)	Left Bank					8					5					2					
SCORE <u>8</u> (RB)	Right Bank					<u>8</u>					5					2					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE <u>5</u> (LB)	Left Bank					8					<u>5</u>					2					
SCORE <u>7</u> (RB)	Right Bank					8					5					2					

Total Score _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>Lower Crum Elbow Ck</u>	LOCATION <u>ROVA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>41.789227</u> LONG <u>-73.949184</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS _____		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/26/12</u> TIME <u>8:30</u> <u>AM</u> PM	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ showers (intermittent) ☐ %cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>20.4</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____		
	Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km ²		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☒ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☒ Residential	Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☒ Obvious sources Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____	
INSTREAM FEATURES	Estimated Reach Length <u>20</u> m Estimated Stream Width <u>11</u> m Sampling Reach Area <u>220</u> m ² Area in km² (m²x1000) _____ km ² Estimated Stream Depth <u>.9</u> m Surface Velocity (at thalweg) <u>1.0</u> m/sec <u>cts</u> Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark <u>1</u> m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle <u>30</u> % ☐ Run <u>40</u> % ☐ Pool <u>30</u> % Channelized ☒ Yes ☐ No Dam Present ☒ Yes ☐ No	
LARGE WOODY DEBRIS	LWD <u>0</u> m ² Density of LWD <u>0</u> m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation <u>5</u> %	
WATER QUALITY	Temperature <u>22.2</u> °C Specific Conductance <u>425</u> Dissolved Oxygen <u>99.1</u> pH <u>8.32</u> Turbidity <u>.41</u> WQ Instrument Used <u>YSI</u> Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☒ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____	
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☒ None ☐ Other _____ Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<u>30</u>	Detritus	sticks, wood, coarse plant materials (CPOM)	<u>0</u>
Boulder	> 256 mm (10")	<u>30</u>			
Cobble	64-256 mm (2.5"-10")	<u>20</u>	Muck-Mud	black, very fine organic (FPOM)	<u>0</u>
Gravel	2-64 mm (0.1"-2.5")	<u>20</u>			
Sand	0.06-2mm (gritty)	<u>0</u>	Marl	grey, shell fragments	<u>0</u>
Silt	0.004-0.06 mm	<u>0</u>			
Clay	< 0.004 mm (slick)	<u>0</u>			

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HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Lower Cuth Fawn Ck</u>	LOCATION <u>ROA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS <u>Techy BES</u>		
FORM COMPLETED BY <u>BES</u>	DATE <u>7/26/12</u> TIME <u>8:30</u> AM PM	REASON FOR SURVEY <u>Annual</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 (4) 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

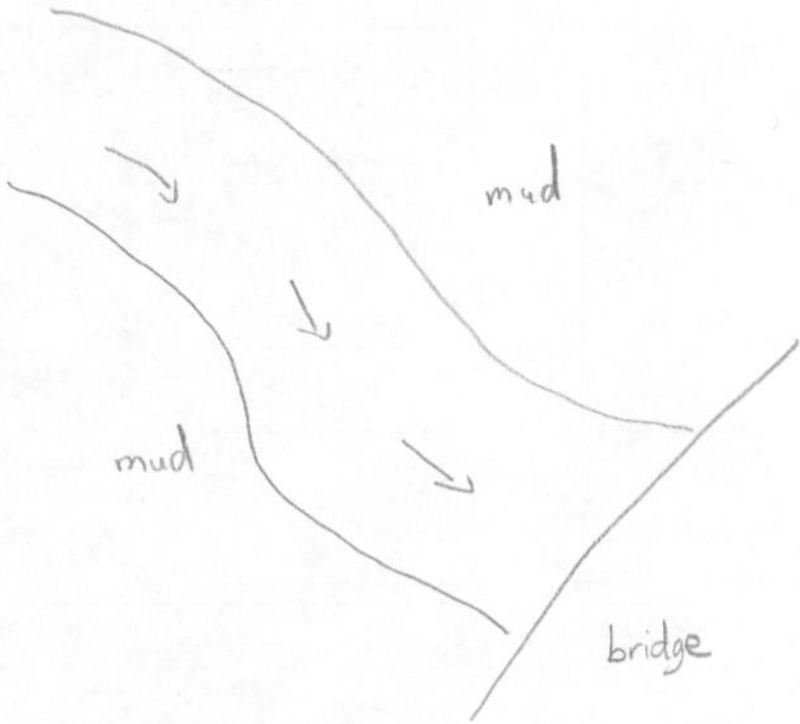
Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE 7 (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE 9 (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE 7 (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE 6 (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE 7 (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE 7 (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

Total Score _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

ROVASE

STREAM NAME <u>Merichay Kill</u>	LOCATION <u>ROVA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>41.762680</u> LONG <u>-73.920341</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS <u>Tach, BES</u>	REASON FOR SURVEY _____	
FORM COMPLETED BY <u>BES</u>	DATE <u>7/29/12</u> TIME <u>13:30</u> AM ☒ PM ☐	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ showers (intermittent) ☐ %cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ ☐ %	Has there been a heavy rain in the last 7 days? ☐ Yes ☐ No Air Temperature <u>22.3</u> <u>27.1</u> Other _____			
	40% ☒					
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) 					
STREAM CHARACTERIZATION	<table border="0"> <tr> <td> Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Non-glacial montane ☐ Swamp and bog </td> <td> ☐ Spring-fed ☐ Mixture of origins ☐ Other _____ </td> <td> Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km² </td> </tr> </table>			Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Non-glacial montane ☐ Swamp and bog	☐ Spring-fed ☐ Mixture of origins ☐ Other _____	Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km ²
Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Non-glacial montane ☐ Swamp and bog	☐ Spring-fed ☐ Mixture of origins ☐ Other _____	Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km ²				

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other ☐ Residential		Local Watershed NPS Pollution ☒ No evidence ☐ Some potential sources ☐ Obvious sources
	Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy		
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____		
INSTREAM FEATURES	Estimated Reach Length <u>20</u> m Estimated Stream Width <u>2</u> m Sampling Reach Area <u>40</u> m ² Area in km² (m²x1000) _____ km ² Estimated Stream Depth <u>1.6</u> m <u>ft</u> Surface Velocity (at thalweg) <u>1.2</u> m/sec <u>ft/s</u>		Canopy Cover ☐ Partly open ☐ Partly shaded ☒ Shaded High Water Mark <u>1.5</u> m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle <u>70</u> % ☐ Run <u>50</u> % ☐ Pool <u>40</u> %
	Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No		
LARGE WOODY DEBRIS	LWD <u>0</u> m ² Density of LWD <u>0</u> m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☐ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation <u>0</u> %		
WATER QUALITY	Temperature <u>22.3</u> °C Specific Conductance <u>653</u> Dissolved Oxygen <u>92.1</u> pH <u>7.98</u> Turbidity <u>3.97</u> WQ Instrument Used <u>YSI</u>		Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other Turbidity (if not measured) ☐ Clear ☒ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other
	Sediment/ Substrate Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Anaerobic ☐ None ☐ Other Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	30
Boulder	> 256 mm (10")	0	Muck-Mud	black, very fine organic (FPOM)	40
Cobble	64-256 mm (2.5"-10")	5	Marl	grey, shell fragments	0
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	20			
Silt	0.004-0.06 mm	55			
Clay	< 0.004 mm (slick)	0			

2012 ROVASE 3 of 4

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME	Merichos Kill		LOCATION	ROVA	
STATION #	RIVERMILE		STREAM CLASS		
LAT	41.76680	LONG	-73.0341	RIVER BASIN	
STORET #			AGENCY	NRS	
INVESTIGATORS	Tech, BES				
FORM COMPLETED BY	BES		DATE	7/24/12	REASON FOR SURVEY
			TIME	13:30 AM	Annual

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
2a: 5 3a: 9 7a: 4	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

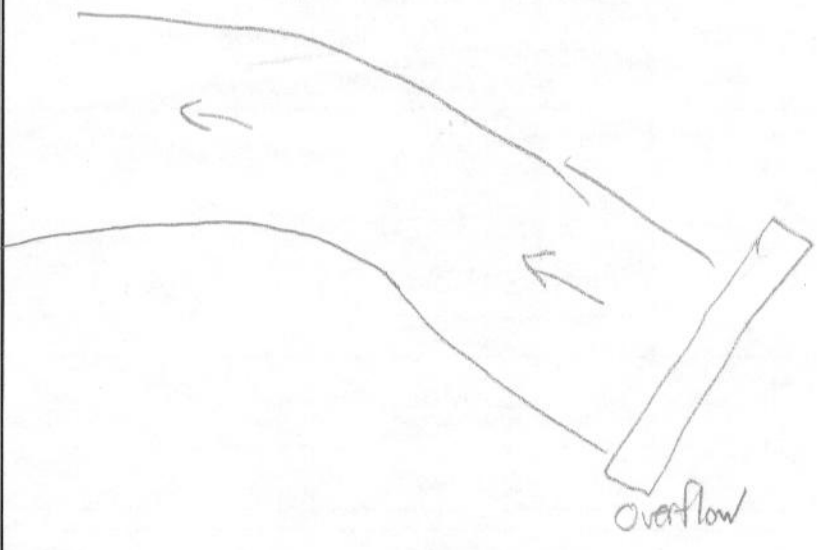
Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE <u>4</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>3</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE <u>2</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>3</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE <u>5</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>6</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

Total Score _____

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(FRONT)**

ROVASF

STREAM NAME <u>Loner Val Kill</u>	LOCATION <u>ROVA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>41.762371</u> LONG <u>-73.899666</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS <u>Tech, BEd</u>	REASON FOR SURVEY _____	
FORM COMPLETED BY <u>BEd</u>	DATE <u>7/24/12</u> TIME <u>12:00</u> AM ☒ PM ☐	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ 40% showers (intermittent) ☐ %cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>26.2</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
			
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____		
	Stream Type ☐ Coldwater ☐ Warmwater Catchment Area _____ km ²		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☒ Obvious sources Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____		
INSTREAM FEATURES	Estimated Reach Length <u>20</u> m Estimated Stream Width <u>3</u> m Sampling Reach Area <u>60</u> m ² Area in km² (m²x1000) _____ km ² Estimated Stream Depth <u>1.6</u> m ft Surface Velocity (at thalweg) <u>1</u> m/sec <u>0.5</u> cfs Canopy Cover ☐ Partly open ☐ Partly shaded ☐ Shaded High Water Mark <u>2</u> m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle <u>20</u> % ☐ Run <u>50</u> % ☐ Pool <u>30</u> % Channelized ☒ Yes ☐ No Dam Present ☒ Yes ☐ No		
LARGE WOODY DEBRIS	LWD <u>0</u> m ² Density of LWD <u>0</u> m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation <u>20</u> %		
WATER QUALITY	Temperature <u>28.7</u> °C Specific Conductance <u>554</u> Dissolved Oxygen <u>70.7</u> pH <u>7.41</u> Turbidity <u>2.61</u> YSI WQ Instrument Used <u>YSI</u> Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☒ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____		
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<u>0</u>	Detritus	sticks, wood, coarse plant materials (CPOM)	<u>20</u>
Boulder	> 256 mm (10")	<u>0</u>			
Cobble	64-256 mm (2.5"-10")	<u>40</u>	Muck-Mud	black, very fine organic (FPOM)	<u>0</u>
Gravel	2-64 mm (0.1"-2.5")	<u>30</u>			
Sand	0.06-2mm (gritty)	<u>20</u>	Marl	grey, shell fragments	<u>0</u>
Silt	0.004-0.06 mm	<u>10</u>			
Clay	< 0.004 mm (slick)				

2012 ROVASF 3 of 4

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <i>Lower Val Kill</i>	LOCATION <i>ROVA</i>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <i>41.762371</i> LONG <i>-73.899666</i>	RIVER BASIN _____	
STORET # _____	AGENCY <i>NPS</i>	
INVESTIGATORS <i>Tech, BES</i>	FORM COMPLETED BY <i>BES</i>	
DATE <i>7/24/10</i> TIME <i>12:00</i> AM (PM) <i>(C)</i>	REASON FOR SURVEY <i>Annual</i>	

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
2a: 14 3a: 11 7a: 12	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE <u>7</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>7</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE <u>5</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>6</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE <u>4</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>4</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

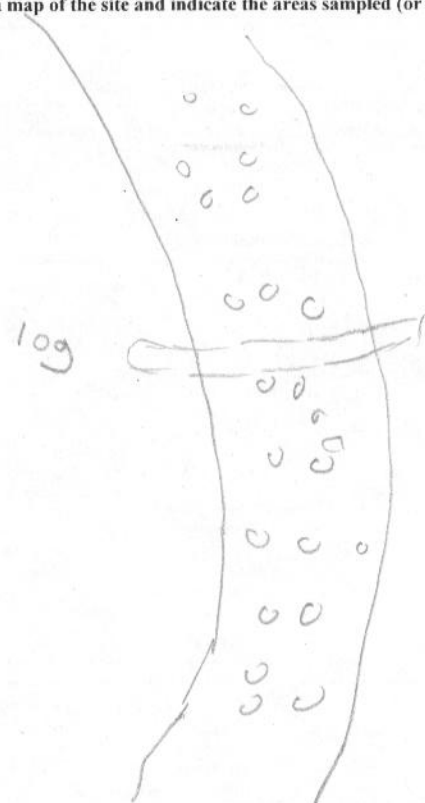
Total Score _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

UP

SAGASA

STREAM NAME <u>Blow Me Down Brook</u>	LOCATION <u>SAGA</u>
STATION # <u>2</u> RIVERMILE	STREAM CLASS
LAT <u>43,503,445</u> LONG <u>72,379,089</u>	RIVER BASIN
STORET #	AGENCY <u>NPS</u>
INVESTIGATORS <u>BGG, BES</u>	
FORM COMPLETED BY	DATE <u>7/10/12</u> TIME <u>1:50</u> AM ☒ PM ☐
	REASON FOR SURVEY <u>ANNUAL</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ 70% showers (intermittent) ☐ %cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>21</u> °C Other _____				
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) 						
STREAM CHARACTERIZATION	<table border="0"> <tr> <td> Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal </td> <td> Stream Type ☒ Coldwater ☐ Warmwater </td> </tr> <tr> <td> Stream Origin ☐ Glacial ☐ Non-glacial montane ☐ Swamp and bog </td> <td> ☐ Spring-fed ☐ Mixture of origins ☐ Other _____ </td> </tr> </table> Catchment Area _____ km ²			Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal	Stream Type ☒ Coldwater ☐ Warmwater	Stream Origin ☐ Glacial ☐ Non-glacial montane ☐ Swamp and bog	☐ Spring-fed ☐ Mixture of origins ☐ Other _____
Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal	Stream Type ☒ Coldwater ☐ Warmwater						
Stream Origin ☐ Glacial ☐ Non-glacial montane ☐ Swamp and bog	☐ Spring-fed ☐ Mixture of origins ☐ Other _____						

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other ☐ Residential	Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources Local Watershed Erosion ☐ None ☒ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous dominant species present <u>conifer, oak, and maple mix</u>	
INSTREAM FEATURES	Estimated Reach Length <u>30</u> m Estimated Stream Width <u>5</u> m Sampling Reach Area <u>150</u> m ² Area in km² (m² x 0.001) _____ km ² Estimated Stream Depth <u>0.10</u> m <u>FT</u> Surface Velocity <u>0.4</u> m/sec <u>CFS</u> at thalweg Canopy Cover ☒ Partly open ☐ Partly shaded ☐ Shaded High Water Mark <u>5</u> m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle _____ % ☐ Run _____ % ☐ Pool _____ % Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No	
LARGE WOODY DEBRIS	LWD <u>2</u> m ² <u>2/150</u> Density of LWD <u>2</u> m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☐ Attached Algae dominant species present <u>none</u> Portion of the reach with aquatic vegetation <u>0</u> %	
WATER QUALITY	Temperature <u>14</u> °C <u>13, 83</u> Specific Conductance <u>164</u> Dissolved Oxygen <u>100.8</u> %, <u>10.41</u> mg/L pH <u>7.96</u> Turbidity <u>1.70</u> LaMotte NTU WQ Instrument Used <u>YSI 600 XL</u> Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☒ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☐ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____	
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Deposits ☐ Sludge ☐ Sawdust ☒ Paper fiber ☒ Sand ☐ Relict shells ☒ Other <u>silt, mud</u> Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<u>2</u>	Detritus	sticks, wood, coarse plant materials (CPOM)	<u>15</u>
Boulder	> 256 mm (10")	<u>3</u>			
Cobble	64-256 mm (2.5"-10")	<u>65</u>	Muck-Mud	black, very fine organic (FPOM)	<u>5</u>
Gravel	2-64 mm (0.1"-2.5")	<u>15</u>			
Sand	0.06-2mm (gritty)	<u>10</u>	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	<u>5</u>			
Clay	< 0.004 mm (slick)	<u>0</u>			

2012 SAGASA 30F4

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Blow Me Down Brook</u>	LOCATION <u>SAGA</u>	
STATION # <u>2</u> RIVERMILE	STREAM CLASS	
LAT <u>43.502205</u> LONG <u>-72.371090</u>	RIVER BASIN	
STORET #	AGENCY <u>NPS</u>	
INVESTIGATORS		
FORM COMPLETED BY <u>BGG, BES</u>	DATE <u>7/10/12</u> TIME <u>1:50</u> AM ☒ PM	REASON FOR SURVEY <u>ANNUAL</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE <u>10</u>	20 19 18 17 16	15 14 13 12 11	<u>10</u> 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE <u>8</u>	20 19 18 17 16	15 14 13 12 11	10 9 <u>8</u> 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE <u>3</u>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 <u>3</u> 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE <u>12</u>	20 19 18 17 16	15 14 13 <u>12</u> 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE <u>7</u>	20 19 18 17 16	15 14 13 12 11	10 9 8 <u>7</u> 6	5 4 3 2 1 0

Parameters to be evaluated in sampling reach

2a:
Score: 15

3a:
Score: 7

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

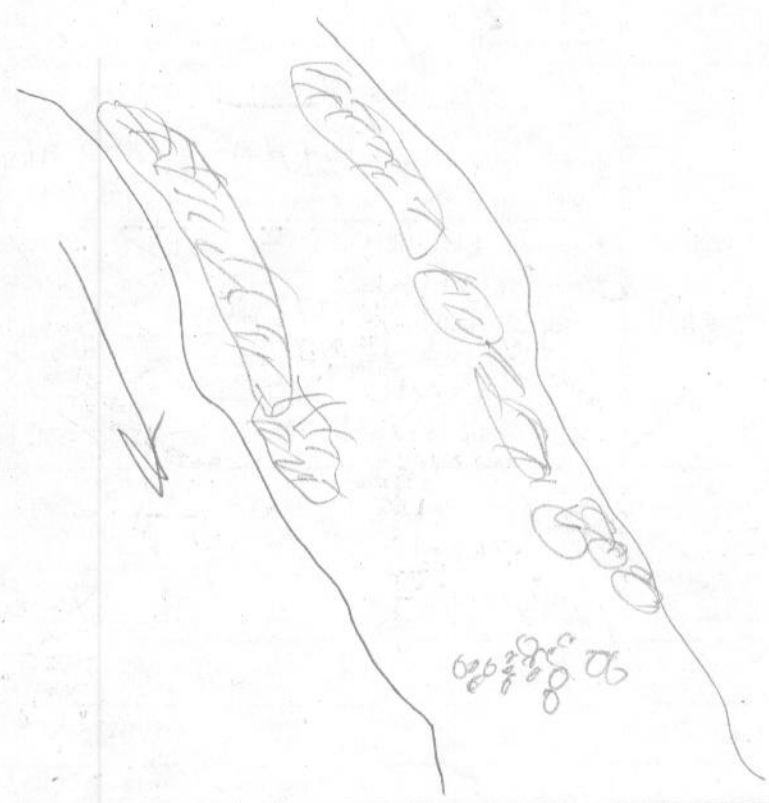
Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration SCORE <u>19</u>	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity SCORE <u>18</u>	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
	20 19 18 17 16	15 14 13 (12) 11	10 9 (8) 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) SCORE <u>5</u> (LB) SCORE <u>6</u> (RB)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	Left Bank 10 9	8 7 6	(5) 4 3	2 1 0
	Right Bank 10 9	8 7 (6)	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	Left Bank 10 9	8 7 6	5 4 3	2 (0) 0
	Right Bank 10 9	8 7 6	5 4 3	(2) 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone) SCORE <u>8</u> (LB) SCORE <u>8</u> (RB)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0

Total Score _____

2012 SAGASB 1 of 4

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>BLAINE DOWN BRK</u>	LOCATION <u>SAGASB</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>43° 30.202</u> LONG <u>72° 22.744</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NFTN-NPS</u>	
INVESTIGATORS <u>WGG BES</u>	DATE <u>7/10/12</u> TIME <u>1500</u> AM ☒ PM ☐	
FORM COMPLETED BY <u>WGG</u>	REASON FOR SURVEY <u>ANNUAL</u>	

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☒ 45% cloud cover ☒ clear/sunny	Past 24 hours ☐ ☐ ☐ 45% ☒	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>21.3</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
			
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____		
	Stream Type ☐ Coldwater ☒ Warmwater Catchment Area _____ km²		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources
	Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy		
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☒ Herbaceous dominant species present _____		
INSTREAM FEATURES	Estimated Reach Length <u>20</u> m Estimated Stream Width <u>11</u> m (15m h/w) Sampling Reach Area <u>20</u> m ² Area in km ² (m ² x 0.001) _____ km ² Estimated Stream Depth <u>0.22</u> m ft Surface Velocity _____ m/sec (at thalweg) <u>0.25 cfs</u>		Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark _____ m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle _____ % ☐ Run <u>100</u> % ☐ Pool _____ % Channelized ☒ Yes ☐ No Dam Present ☐ Yes ☒ No
LARGE WOODY DEBRIS	LWD <u>0</u> m ² Density of LWD <u>0</u> m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present <u>W/A BROWN ALGAE (slime)</u> Portion of the reach with aquatic vegetation <u>95</u> %		
WATER QUALITY	Temperature <u>19.22</u> °C Specific Conductance <u>181</u> Dissolved Oxygen <u>105.340</u> (9.73 mg/L) pH <u>7.84</u> Turbidity <u>345</u> NTU WQ Instrument Used <u>YSI</u>		Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other Turbidity (if not measured) ☐ Clear ☒ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other
SEDIMENT/SUBSTRATE	Odors ☐ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☒ Other <u>EARTHY</u> Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☒ No <u>but DARK BROWN</u>		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<u>0</u>	Detritus	sticks, wood, coarse plant materials (CPOM)	<u>290</u>
Boulder	> 256 mm (10")	<u>0</u>			
Cobble	64-256 mm (2.5"-10")	<u>70</u>	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	<u>10</u>			
Sand	0.06-2mm (gritty)	<u>15</u>	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	<u>5</u>			
Clay	< 0.004 mm (slick)	<u>0</u>			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Blowing Rock</u>		LOCATION <u>SAGASB</u>	
STATION # _____ RIVERMILE _____		STREAM CLASS _____	
LAT <u>43°30.202</u> LONG <u>72°22.744</u>		RIVER BASIN _____	
STORET # _____		AGENCY <u>NPS</u>	
INVESTIGATORS _____			
FORM COMPLETED BY <u>BGG, BES</u>		DATE <u>7/10/12</u> TIME <u>4:29</u> AM ☒ PM	REASON FOR SURVEY _____

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient). SCORE <u>10</u>	20 19 18 17 16	15 14 13 12 11	<u>10</u> 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common. SCORE <u>0</u>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 <u>0</u>
3. Pool Variability Even mix of large-shallow, large-deep, small-shallow, small-deep pools present. SCORE <u>0</u>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 <u>0</u>
4. Sediment Deposition Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. SCORE <u>10</u>	20 19 18 17 16	15 14 13 12 11	<u>10</u> 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. SCORE <u>13</u>	20 19 18 17 16	15 14 <u>13</u> 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE 19	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE 6	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE 8 (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE 8 (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE 9 (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE 9 (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE 8 (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE 9 (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

Total Score _____

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(FRONT)**

SARASA

STREAM NAME <u>Kroma Kill</u>	LOCATION <u>SARA</u>
STATION # _____ RIVERMILE _____	STREAM CLASS _____
LAT <u>43.005871</u> LONG <u>-73.617195</u>	RIVER BASIN _____
STORET # _____	AGENCY <u>NPS</u>
INVESTIGATORS _____	
FORM COMPLETED BY <u>BEA, LW</u>	DATE <u>7/30/12</u> TIME <u>12:30</u> AM ☒ PM ☐
REASON FOR SURVEY <u>Annual</u>	

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ 40% showers (intermittent) ☐ %cloud cover ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>27.1</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____	Stream Type ☐ Coldwater ☒ Warmwater ? Catchment Area ? km²	

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources Local Watershed Erosion ☐ None ☒ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☒ Grasses ☐ Herbaceous dominant species present _____		
INSTREAM FEATURES	Estimated Reach Length 30 m Estimated Stream Width 2 m Sampling Reach Area 60 m ² Area in km² (m²x1000) _____ km ² Estimated Stream Depth 0.6 m Surface Velocity (at thalweg) 0.27 m/sec cft/s		Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark 1 m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle 28% ☐ Run 40% ☐ Pool 40% Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☐ No
LARGE WOODY DEBRIS	LWD 0 m ² Density of LWD 0 m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation 10%		
WATER QUALITY	Temperature 22.1 °C Specific Conductance 491/491 Dissolved Oxygen 112.7/9.8 pH 8.45 Turbidity 21.5 WQ Instrument Used YSI		Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☐ Clear ☐ Slightly turbid ☒ Turbid ☐ Opaque ☐ Stained ☐ Other _____
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☒ Paper fiber ☒ Sand ☐ Relict shells ☒ Other silt Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		40	Detritus	sticks, wood, coarse plant materials (CPOM)	10
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	30	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	20			
Clay	< 0.004 mm (slick)	0			

2012 SARASA 3 of 4

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME	Kroma Kill	LOCATION	SARA
STATION #	RIVERMILE	STREAM CLASS	
LAT 43.005871	LONG -73.617195	RIVER BASIN	
STORET #	AGENCY		
INVESTIGATORS			
FORM COMPLETED BY	BKJ	DATE 7/31/12 TIME 12:30 AM PM	REASON FOR SURVEY Annual

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

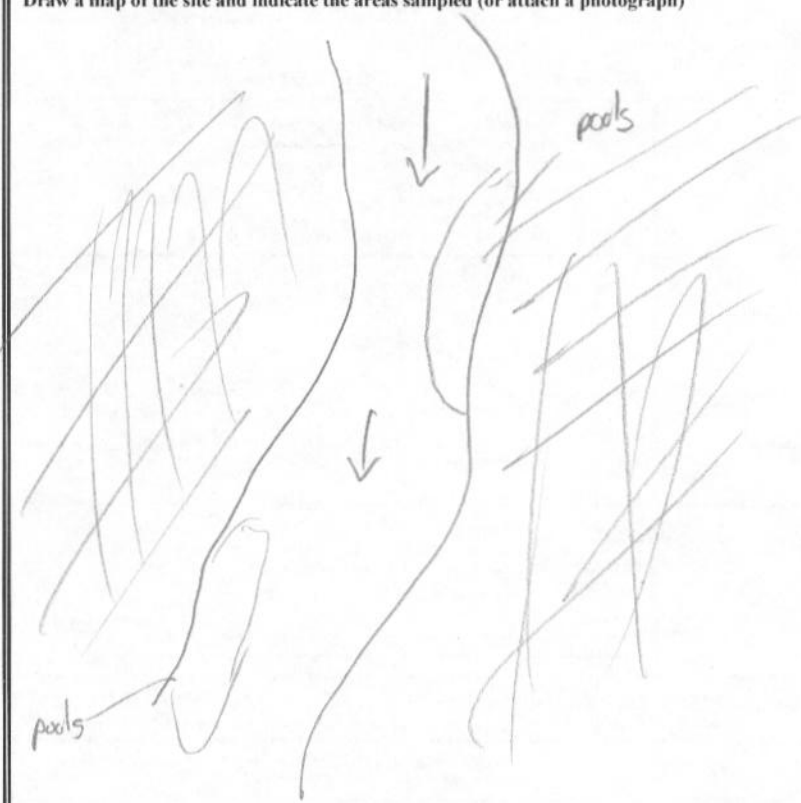
Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 5 (LB)	Left Bank 10 9	8 7 6	(5) 4 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 (4) 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 (4) 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 (4) 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE 5 (LB)	Left Bank 10 9	8 7 6	(5) 4 3	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	(5) 4 3	2 1 0

Total Score _____

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(FRONT)**

SARASB

STREAM NAME <u>American's Creek</u>	LOCATION <u>SARA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>42.977055</u> LONG <u>-73.631058</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS _____		
FORM COMPLETED BY <u>BAJ</u>	DATE <u>7/31/12</u> TIME <u>14:50</u> AM ☒ PM ☐	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ showers (intermittent) ☐ %cloud cover <u>20%</u> ☐ clear/sunny	Past 24 hours ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>22.8</u> °C Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph) 		
STREAM CHARACTERIZATION	Stream Subsystem ☐ Perennial ☒ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____		Stream Type ☐ Coldwater ☒ Warmwater Catchment Area <u>?</u> km ²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☐ Obvious sources Local Watershed Erosion ☐ None ☒ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☒ Shrubs ☐ Grasses ☒ Herbaceous dominant species present <u>?</u>		
INSTREAM FEATURES	Estimated Reach Length <u>30</u> m Estimated Stream Width <u>2</u> m Sampling Reach Area <u>60</u> m ² Area in km² (m²x1000) _____ km ² Estimated Stream Depth <u>0</u> m-ft Surface Velocity (at thalweg) _____ m/sec <u>0.1 ft/s</u> Canopy Cover ☐ Partly open ☐ Partly shaded ☒ Shaded High Water Mark <u>2</u> m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle _____ % ☐ Run _____ % ☐ Pool <u>100</u> % Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No		
LARGE WOODY DEBRIS	LWD <u>3</u> m ² Density of LWD _____ m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☐ Attached Algae dominant species present <u>none</u> Portion of the reach with aquatic vegetation <u>0</u> %		
WATER QUALITY	Temperature <u>21.9</u> °C Specific Conductance <u>535</u> Dissolved Oxygen <u>67.7</u> pH <u>7.89</u> Turbidity <u>9.85</u> WQ Instrument Used <u>YSI</u> Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☒ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☐ None ☐ Other _____ Turbidity (if not measured) ☐ Clear ☐ Slightly turbid ☒ Turbid ☐ Opaque ☐ Stained ☐ Other _____		
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand ☐ Relict shells ☒ Other <u>silt, clay</u> Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<u>0</u>	Detritus	sticks, wood, coarse plant materials (CPOM)	<u>0</u>
Boulder	> 256 mm (10")	<u>0</u>			
Cobble	64-256 mm (2.5"-10")	<u>0</u>	Muck-Mud	black, very fine organic (FPOM)	<u>0</u>
Gravel	2-64 mm (0.1"-2.5")	<u>60</u>			
Sand	0.06-2mm (gritty)	<u>0</u>	Marl	grey, shell fragments	<u>0</u>
Silt	0.004-0.06 mm	<u>20</u>			
Clay	< 0.004 mm (slick)	<u>30</u>			

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HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>American's Creek</u>	LOCATION <u>SARA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>42.97055</u> LONG <u>-73.631058</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS <u>BGA NPS</u>		
FORM COMPLETED BY <u>BGA</u>	DATE <u>7/31/12</u> TIME <u>14:50</u> AM ☒ PM ☐	REASON FOR SURVEY <u>Annual</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 (1) 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 <u>18</u> 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 <u>14</u> 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE <u>5</u> (LB)	Left Bank 10 9	8 7 6	<u>5</u> 4 3	2 1 0
SCORE <u>5</u> (RB)	Right Bank 10 9	8 7 6	<u>5</u> 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE <u>2</u> (LB)	Left Bank 10 9	8 7 6	5 4 3	<u>2</u> 1 0
SCORE <u>2</u> (RB)	Right Bank 10 9	8 7 6	5 4 3	<u>2</u> 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE <u>9</u> (LB)	Left Bank 10 <u>9</u>	8 7 6	5 4 3	2 1 0
SCORE <u>9</u> (RB)	Right Bank 10 <u>9</u>	8 7 6	5 4 3	2 1 0

Total Score _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

SARASC

STREAM NAME <u>Upper Mill Creek</u>	LOCATION <u>SARA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>42.997375</u> LONG <u>-73.648468</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS _____		
FORM COMPLETED BY <u>BEA</u>	DATE <u>7/31/12</u> TIME <u>4:00</u> AM ☒ PM ☐	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☒ showers (intermittent) ☐ %cloud cover _____ ☐ clear/sunny	Past 24 hours ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☐ %cloud cover _____ ☒ clear/sunny	Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature _____ °C <u>30.8</u> Other _____
	40% ☒		
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) 		
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☒ Intermittent ☐ Tidal Stream Type ☐ Coldwater ☒ Warmwater Catchment Area _____ km² Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential		Local Watershed NPS Pollution ☐ No evidence ☒ Some potential sources ☒ Obvious sources Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☐ Trees ☒ Shrubs ☒ Grasses ☐ Herbaceous dominant species present _____ ?		
INSTREAM FEATURES	Estimated Reach Length 20 m Estimated Stream Width 2 m Sampling Reach Area 40 m ² Area in km² (m² x 1000) _____ km ² Estimated Stream Depth _____ m ft Surface Velocity _____ m/sec (at thalweg) 0.4 ft/s Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark _____ m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle _____ % ☐ Run _____ % ☐ Pool _____ % Channelized ☒ Yes ☐ No Dam Present ☐ Yes ☒ No		
LARGE WOODY DEBRIS	LWD _____ m ² Density of LWD _____ m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ ? Portion of the reach with aquatic vegetation 30 %		
WATER QUALITY pool	Temperature 30.8 °C 27.5 Specific Conductance 524 Dissolved Oxygen 211% pH 8.27 Turbidity 1.67 WQ Instrument Used YSI Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globbs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____		
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☒ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	0
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	20	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	0	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)	0			

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HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Upper Mill Creek</u>	LOCATION <u>SARA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>42.997375</u> LONG <u>73.648468</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS _____		
FORM COMPLETED BY <u>RES</u>	DATE <u>7/31/12</u> TIME <u>14:00</u> AM ☒ PM ☐	REASON FOR SURVEY <u>Annual</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 <u>12</u> 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 <u>16</u>	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 <u>4</u> 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 <u>14</u> 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 <u>0</u>

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HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 7 (LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE 5 (LB)	Left Bank 10 9	8 7 6	(5) 4 3	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	(5) 4 3	2 1 0

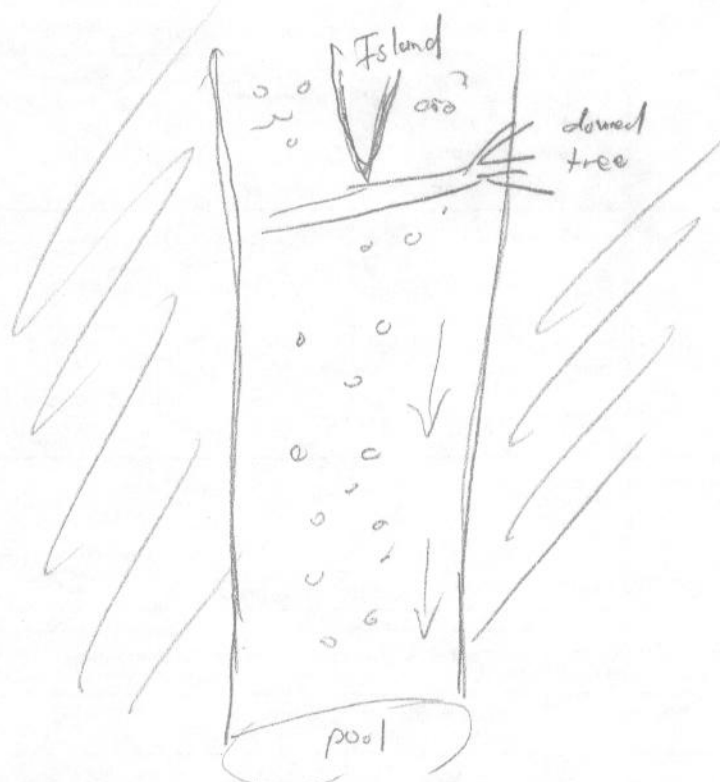
Total Score _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

SARASD

STREAM NAME <u>Mill Ck Cont</u>	LOCATION <u>SARA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT <u>42.988834</u> LONG <u>-73.625490</u>	RIVER BASIN _____	
STORET # _____	AGENCY <u>NPS</u>	
INVESTIGATORS _____		
FORM COMPLETED BY <u>REA</u>	DATE TIME <u>11:15</u> <u>7/31/12</u> AM PM	REASON FOR SURVEY <u>Annual</u>

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☒ 10% cloud cover ☒ clear/sunny	Past 24 hours ☐ ☐ ☐ ☐ % ☐	Has there been a heavy rain in the last 7 days? ☒ Yes <u>NO</u> Air Temperature _____ °C <u>24.4</u> Other _____
	SITE LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION Stream Subsystem ☐ Perennial ☒ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____	Stream Type ☐ Coldwater ☒ Warmwater Catchment Area _____ km ²		



PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential		Local Watershed NPS Pollution ☒ No evidence ☐ Some potential sources ☐ Obvious sources Local Watershed Erosion ☐ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous dominant species present _____ ?		
INSTREAM FEATURES	Estimated Reach Length <u>30</u> m Estimated Stream Width <u>2</u> m Sampling Reach Area <u>60</u> m ² Area in km² (m²x1000) _____ km ² Estimated Stream Depth <u>1</u> m <u>ft</u> Surface Velocity (at thalweg) <u>0.15</u> m/sec Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark <u>1.5</u> m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle <u>60</u> % ☐ Run <u>20</u> % ☐ Pool <u>20</u> % Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No		
LARGE WOODY DEBRIS	LWD <u>2</u> m ² Density of LWD _____ m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation <u>80</u> %		
WATER QUALITY	Temperature <u>21.5</u> °C Specific Conductance <u>371</u> Dissolved Oxygen <u>98.5</u> pH <u>8.01</u> Turbidity <u>8.33</u> WQ Instrument Used <u>YSI</u> Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☒ Slick ☐ Sheen ☐ Globs ☐ Flecks ☐ None ☐ Other _____ Turbidity (if not measured) ☐ Clear ☒ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____		
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☒ Anaerobic ☐ None ☐ Other _____ Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	0
Boulder	> 256 mm (10")	10			
Cobble	64-256 mm (2.5"-10")	60	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	5	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Mill Confluence</u>	LOCATION <u>SARA</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS _____		
FORM COMPLETED BY _____	DATE <u>7/31/12</u> TIME <u>11:15</u> <u>AM</u> PM	REASON FOR SURVEY <u>Annual</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 <u>16</u>	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	<u>10</u> 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 <u>14</u> 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 <u>14</u> 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 <u>0</u>

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.					Channel straight; waterway has been channelized for a long distance.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE <u>5</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>5</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE <u>4</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>4</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE <u>9</u> (LB)	Left Bank 10 9					8 7 6					5 4 3					2 1 0					
SCORE <u>9</u> (RB)	Right Bank 10 9					8 7 6					5 4 3					2 1 0					

Total Score _____